

Digital Arts and Humanities Workshop Series – Fall 2017
Fridays @ noon -- Scholars Commons IQ-Wall

Date	Topic	Presenter
Aug. 25	Intro to Visualization	Michael Boyles
Sep. 1	Intro to Digital Humanities	Tassie Griady
Sep. 8	Virtual Reality	Bill Sherman
Sep. 15	Intro to R	Tassie Griady
Sep. 22	Advanced Media	Chris Blier
Sep. 29	Augmented Reality	Chauncey Frend
Oct. 13	R for Text	Tassie Griady
Oct. 20	Network Graphs	David Kloster
Oct. 27	IQTables & TouchEnabled Software Workflows	David Reagan
Nov. 3	3D Scanning & Printing	Jeff Rogers
Nov. 10	3D Photogrammetry	Tassie Griady
Dec. 1	R for Twitter	Tassie Griady



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Virtual Reality
within the UITS Advanced Visualization Lab

(for the digital arts & humanities at Indiana University)

Bill Sherman
 Advanced Visualization Lab
 Indiana University

September 8, 2017



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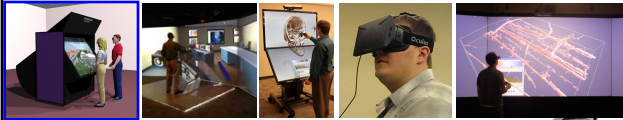
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Virtual Reality at IU

- AVL established in 1997 – doing VR right out of the gate!
 - (Also, Happy 20th birthday)
- Now, more than a century of experience in VR!
 - cumulative



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VR: a definition

- A medium composed of interactive computer simulations that sense the *participant's position and actions*, and replace or augment the feedback to one or more senses, giving the feeling of being mentally immersed or being "present" in the simulation.



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VR: a definition

- A medium composed of interactive computer simulations that **sense the participant's position and actions**, and replace or augment the feedback to one or more senses, giving the feeling of being mentally immersed or being "present" in the simulation.
 - Track the user



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VR: a definition

- A medium composed of interactive computer simulations that sense the *participant's position and actions*, and **replace or augment the feedback to one or more senses**, giving the feeling of being mentally immersed or being "present" in the simulation.
 - Track the user
 - Display to the user



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VR: a definition

- A medium composed of interactive computer simulations that sense the *participant's* position and actions, and replace or augment the feedback to one or more senses, giving the **feeling of being mentally immersed or being "present" in the simulation.**
 - Track the user
 - Display to the user
 - **Immerse the user**



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Replacing the senses

- Displays coupled to the user's head
- Displays that the user enters
- Displays that the user holds



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HMD: Screens coupled to the head

- 1968: invented by Ivan Sutherland at Utah
- 1990's-2000's: research-oriented
- 2012: Oculus Kickstarter funded
- 2016: Oculus Rift / HTC Vive / Playstation VR
- 2017: "Reality Labs" established at IUB



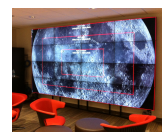
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CAVE: Stationary display style VR

- 1991: invented by Sandin/DeFanti at UIC
- 1997: 4-sided CAVE installed at IUB in Lindley Hall
- 2005: At IUPUI, Virtual Reality Theater installed
- 2010: At IUB, VCT deployed
- 2014: At IUB, Scholars' Commons IQ-wall deployed
- 2017: At IUPUI, Virtual Reality Theater decommissioned



VR Projects at IU

- Art:
 - Dolinsky's *Figuratively Speaking*
- Education & Training:
 - Lighting Lab
 - AMML CRC machine
 - Piazza d'Oro
 - Identity "Stab Lab"
- Visual Simulation:
 - Lux et Veritas
- Scientific Visualization:
 - Volumes (Mouse Brain)
 - Point Clouds (LIDAR & Photogrammetry)
- Media/Narrative:
 - IU Sports Experiences



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Current VR Tech at IU

- **Campus:**
 - IQ-Walls (10+ sites)
 - HTC Vive "Reality Labs"
- **Lab:**
 - HTC Vive
 - Oculus Rift CV1
 - Smartphone VR
 - PIPES environmental experiences



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IU Reality Labs

- **Three Way Collaboration:**
 - Advanced Visualization Lab (AVL)
 - Student Technology Center (STC)
 - Local department (e.g. Media School / School of Art and Design)
- **Catalyst:**
 - Consumer-priced VR systems
 - Marketplace of applications
- **Initial Labs:**
 - Kirkwood Hall 016
 - Franklin Hall 052
 - Fine Arts 215
 - IUPUI Labs in development



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IU Reality Labs

- **Fostering Virtual Reality Usage:**
 - Vetting applications from the marketplace:
 - For use as outreach
 - For integration into IU courses as teaching aid
 - IU content creation:
 - Tools to present student produced media content
 - Tools to create a VR experience from scratch
- Reality Labs are seeded with ~dozen app



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Open Access Spaces

- **IUPUI (former VRT space)**
 - HTC Vive HMD ("Reality Stations")
 - Oculus Rift CV1 HMDs
 - PIPES 4D Environmental Effects
- **IUB Innovation Center**
 - Visualization Collaboration Theater
- **IUB Wells Library**
 - Coming Soon: 4th Floor openspace
 - (near Maker Lab)
 - 6 Reality Stations
- **SOAD DART Lab**
 - Coming Soon: 2 Reality Stations



Building Experiences / VR Workflows

- **Experience:**
 - Assets
 - Display
 - Interface



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Building Experiences / VR Workflows

- **Experience:**
 - Assets
 - Hand-modeled (Maya / Rhino)
 - Captured (scanned / photogrammetry / 360 video)
 - Computed (BigRed2 simulation)
 - Display
 - Large-screen
 - HMD
 - Phone
 - Interface
 - Delivery (Web / App)
 - Programming (Unity / WebGL / FreeVR)
 - User (Navigation / Interaction)



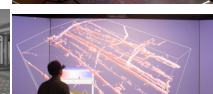
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VR Applications

- **Art:**
 - Prof. Dolinsky and her students
- **Education & Training:**
 - Piazza d'Oro
 - Star Cluster Experience (also sci-vis)
- **Visual Simulation:**
 - Lux et Veritas
 - Global NOC
- **Scientific Visualization:**
 - ParaView / VTK
 - Volumes
 - Point Clouds
- **Media/Narrative:**
 - Cuban Center IU Sports Experiences



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Learning Opportunities

- Academic Classes:
 - Prof. Dolinsky
 - Sherman
 - Chabin
- Workshops & Tutorials:
 - Coming soon: RealityLab Tools
 - YouTube channel (AVLtube)
 - Group presentations
- Consulting:
 - One on one / small group
- Online Resources:
 - AVL generated
 - AVL curated



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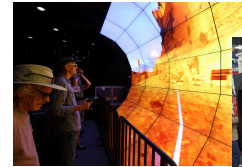


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Crossing the Threshold

- VR in the Classroom:
 - Teaching about VR
 - Teaching with VR
- Collaborating within VR
- IU "Reality Labs"



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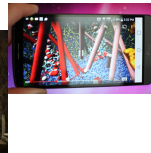


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VR Demonstrations

- HMD:
 - Figuratively Speaking
 - Sketchfab examples
 - Google Earth VR
 - Tilt Brush
- Smartphone:
 - Star-cluster viewer
 - Youtube 360



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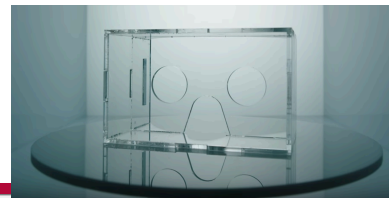


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But First ...

- Google Cardboard ... Plastic!



Thank You!

Demos & Discussion

- HMD:
 - Figuratively Speaking
 - Sketchfab examples
 - Google Earth VR
 - Tilt Brush
- Smartphone:
 - Star-cluster viewer
 - Youtube 360
 - YouVisit IU 360

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